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(56) Documents Cited
GB 1555673 A US 4618292 A US 4123113 A

(58) Field of Search

UK CL (Edition L) B8A A31B A32A A32B
INT CL⁵ B65G 51/00 51/02 51/03
ONLINE DATABASES: WPI

(54) Load sensing and conveying system

(57) The load sensing and handling system has a bed or plate with ports, channels or slots cut into it. The bed also contains sensor arrays to ascertain the location of an object within the system; although other methods such as externally mounted sensors or readers may also be utilised. The output of the sensors is supplied to a computerised control system which activates the ports directly beneath the object to produce a pressure gradient in order to move the object. The pressure beneath each side of the object may be varied to control the direction of movement of the object. Once the object clears a line of sensors the ports to the rear of the object are de-activated.

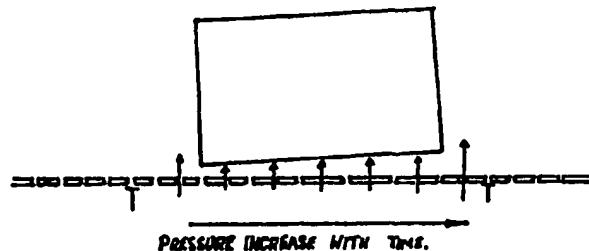
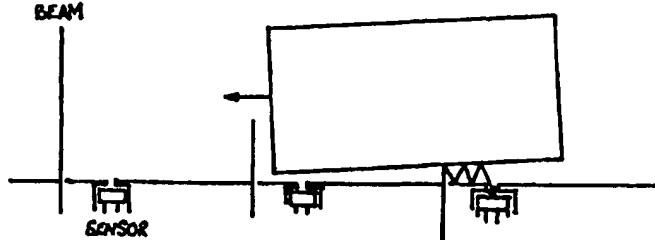
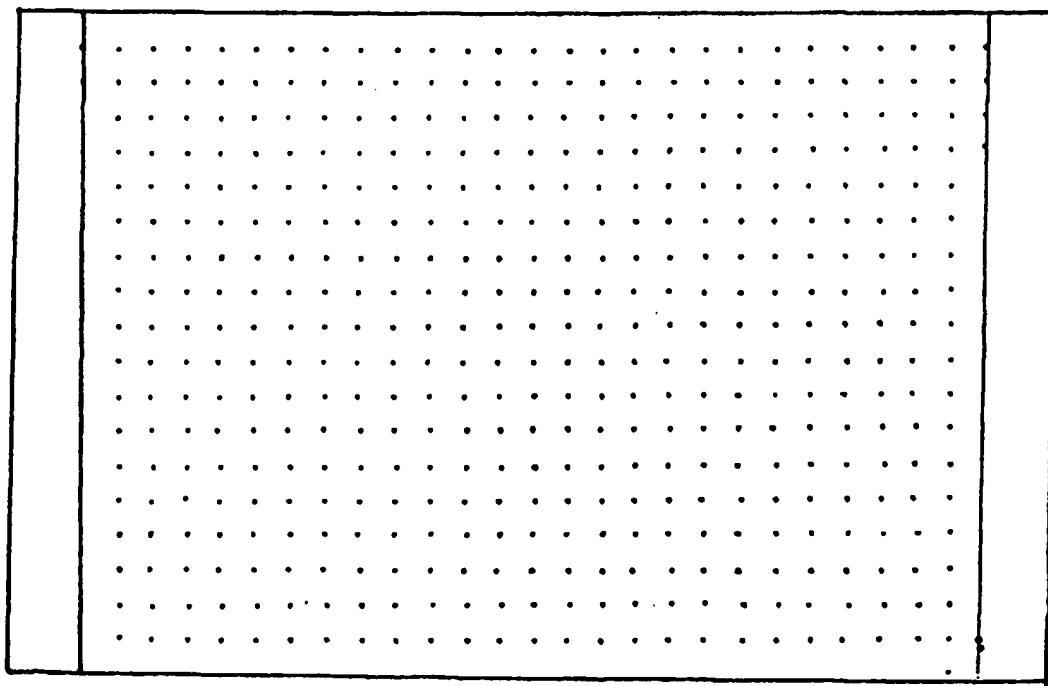
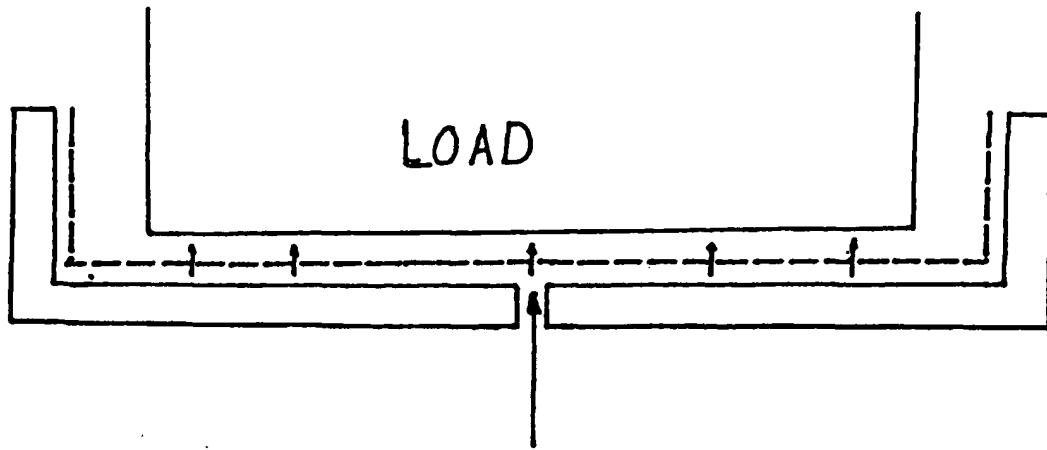


FIGURE 2

BASIC SYSTEM



PLAN

FIGURE 1

SENSING SYSTEM

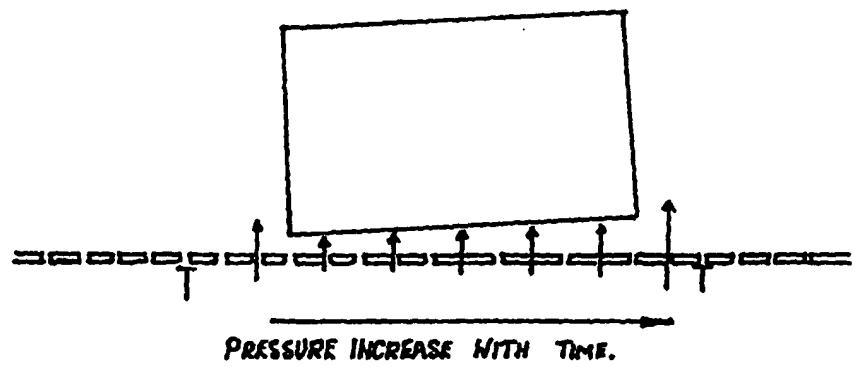
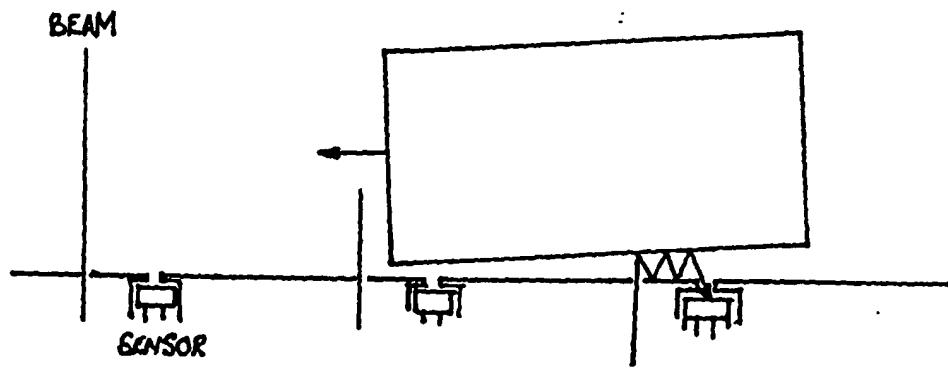


FIGURE 2

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Flow Diagram of Envisaged System.

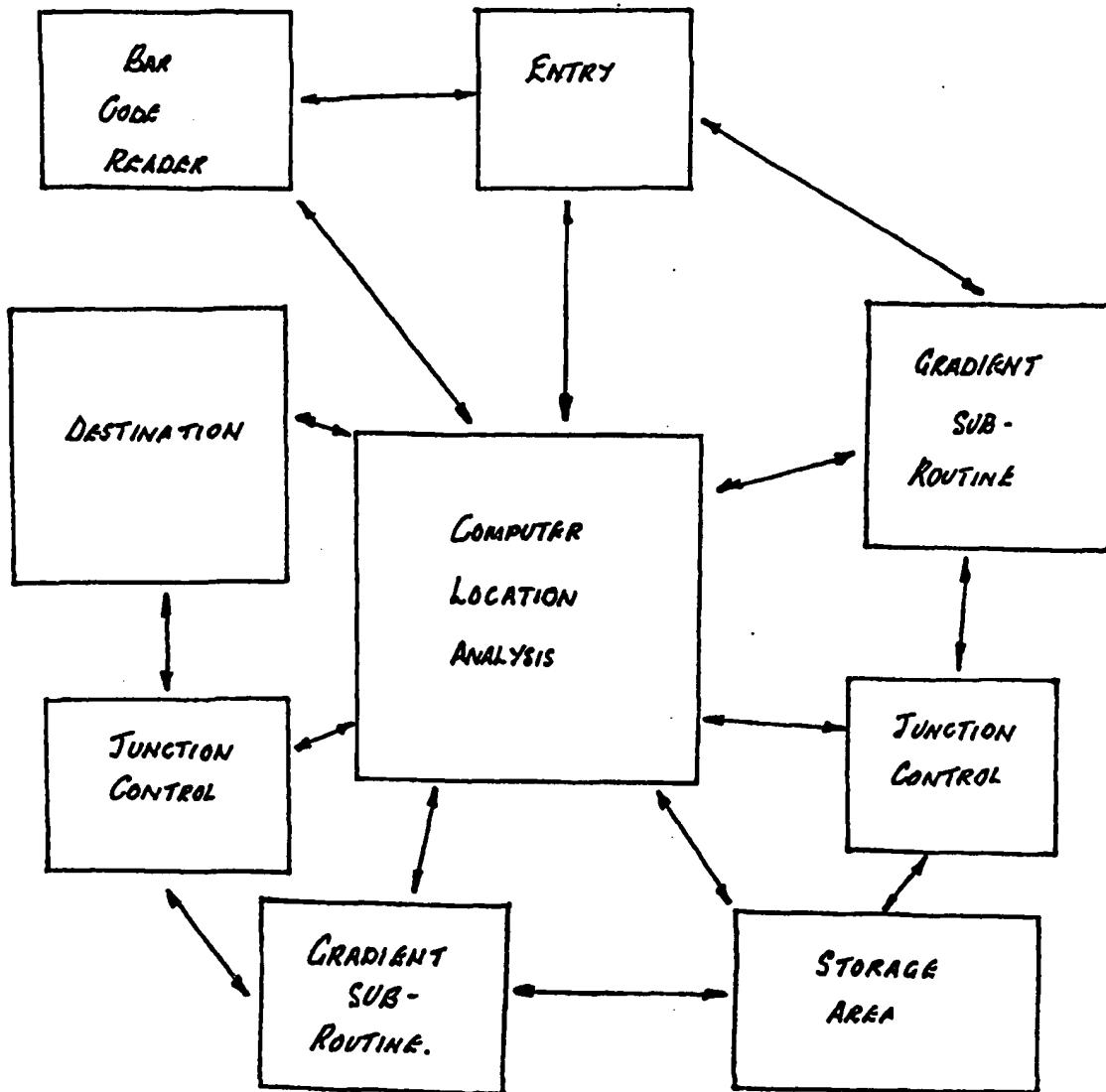


FIGURE 3

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LOAD SENSING HANDLING SYSTEM

This invention relates to a load sensing and handling system.

The use of fluids or gases for moving products in industry is not new. However, the use of a flat conveyor utilising a gradient of air or fluid and regular sensing devices to regulate and record the motion of objects does not seem to be widely used in industry at this time.

More preferable it seems is the use of a belt conveyor which must be kept moving even when there is nothing upon it. The load sensing pneumatic or hydraulic system would appear to have several advantages over the present systems in use :

1. It can be linked to a computer which will then know the exact location of an object, ie; within a stock handling system or production system.
2. It will guide an object to its desired destination.
3. It will only operate when an object is placed upon it.
4. It will only operate at the specific location of the object at the time.

A specific embodiment of the invention will now be described by way of example with reference to the accompanying drawings in which:

Figure 1 shows in cross sectional front elevation a load being supported and guided by either a gaseous or fluid medium. Also in figure 1 is a plan view of the conveyor surface.

Figure 2 shows in cross sectional side elevation the mode of operation of the sensing system and an illustration of how the object will move along the conveyor when pressure is gradually increased with time.

Figure 3 shows a flow diagram of the envisaged system and how the different systems will interact in a certain way in a given situation.

Referring to the drawings the proposed system will operate in the following way :

As an object is placed upon the unit it encounters the first of numerous sensors imbedded in the base or sides of the unit (illustrated by the upper diagram in figure 2) these will report to the system computer and activate the pressure gradient ports at that location. Because the system will be direction orientated the ports to the rear of the object will be creating a greater pressure at the rear of the object than at the front. This will in effect cause the object to fall down a pressure gradient or 'ramp' of gas or fluid (illustrated by the bottom diagram in figure 2). As it 'glides' forward the object encounters another sensor which reports the new location of the object to the computer which maintains the pressure gradient at the new location. As the object or load clears a line of sensors the ports to the rear of the object are deactivated. The object or load will continue down the conveyor at a uniform speed as long as the routine is repeated. To keep the object central upon the unit it is envisaged that a slight pressure increase to the left and right sides and/or undersides of the object will keep it upon the desired path (illustrated in the uppermost diagram of figure 1).

The most feasible design for the conveyor bed would be simple round holes in the bed although channels and/or slots could also be used (illustrated in figure 1, bottom diagram).

It is envisaged that this system could utilise current technology such as bar code scanners in sending an item to a precise point in a warehouse or production system where it could be stored and retrieved when needed automatically. By varying the pressure gradient at junctions the object can be moved in any number of directions and therefore to any point in a system.

A flow diagram illustrating such a system is depicted in figure three.

CLAIMS

1. A load sensing and handling system comprising : a flat bed with individual ports, slots or channels. A fluid or gaseous medium that imparts motion into an object and control of that object. A method of sensing the location of an object or objects within the system. An intelligent subsystem capable of manipulating objects within the system.
2. A load sensing and handling system as claimed in Claim 1 wherein sensing devices or mechanisms are incorporated into the bed, the side sills or mounted vertically overhead or horizontally from the sides.
3. A load sensing and handling system as claimed in Claims 1 and 2 wherein computerised or mechanical systems are utilised for moving objects by means of a fluid or gaseous medium.
4. A load sensing and handling system as claimed in Claims 1, 2 and 3 wherein intelligent location sensing systems are used for moving, storing and retrieving objects within stock, production or urban or rural transit systems.

Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

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Relevant Technical fields

(i) UK CI (Edition L) B8A (A31B, A32A, A32B)

(ii) Int CI (Edition 5) B65G (51/00, 51/02, 51/03)

Search Examiner

S WALLER

Databases (see over)

(i) UK Patent Office

(ii) ONLINE DATABASE: WPI

Date of Search

19 MAY 1993

Documents considered relevant following a search in respect of claims 1-4

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	GB 1555673 (IBM) See page 4 lines 2 to 123	1 to 4
X	US 4618292 (IBM) See Figure 13 and Abstract	1 to 4
A	US 4123113 (FORD) See column 3 lines 55 to 66	

Category	Identity of document and relevant passages 5.	Relevant to clz 3)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

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P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

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